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LOCAL LAND USE POLICY AND INVESTMENT INCENTIVES

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Table of Contents

I. Introduction 1

II. Why Focus on Growth? 3
Observing Existing Land Use Patterns From the Dynamic Perspective 3
Dominance of the Static Perspective 6
Regulatory Policies as Signals 7

III. Regulation and Property Rights 8
Regulatory Takings 8
Threat of Regulation 11

IV. Prohibiting Development 14

V. Regulating Development Timing 18

VI. Restricting Allowed Uses 23
Dynamic Effects of Land Use Restrictions Under Certainty 23
Uncertain Restrictions on Allowed Density 24
Regulatory Risk Versus Private Ownership Risk 27

VII. Development Fees 29

VIII. Conclusion 30

Bibliography 32

I. Introduction

Recent research on land use restrictions emphasizes the role of regulation in the urban development process. The intertemporal perspective of this work reveals how regulation alters the pace and pattern of land development across the urban area, with varying effects on both regulated and unregulated property reflecting the pattern of growth or decline in the underlying demands for land by competing land uses. The results are novel in that they fundamentally differ from the implications of static analyses, yet this survey reveals that they are robust across the different types of land use regulations studied. This paper summarizes and discusses the results of a series of recent papers studying development prohibition, development moratoria, and allowed use restrictions. It provides an informal presentation of key results and relationships that is geared to the nontechnical specialist, especially to professionals with a policy perspective.

The underlying theme of this paper is that policy design and evaluation requires a firm grounding in how real estate markets respond to different types of land use and tax policies. The longevity of capital improvements and the relatively high costs required to modify structures and infrastructure once put into place means that market participants choose from alternative projects whose net returns extend into the indefinite future. The key to understanding capital and real property markets is to recognize their inherently dynamic nature. Because urban real estate plays a central role in urban economies, it is perhaps not surprising that dynamic or intertemporal analysis has become a widely used tool in modern urban economics.[1] But the dynamic perspective needs to attain greater prominence in the modern planning and policy tool kit as well. Therefore, one task for this paper is to illustrate how the dynamic or intertemporal view of the urban development process leads to insights that are not evident in the traditional static approach.

This discussion addresses two related issues in land use controls. The first issue concerns how the threat of land use regulation affects the pace and pattern of

[1] See Brueckner (2000) for an overview of dynamic land market models. The Fujita-Wheaton-Turnbull model that underlies much of the analysis discussed in this paper is developed in the series of papers by Fujita (1982), Wheaton (1982), and Turnbull (1988).

urban development. The second issue concerns how constitutional and legal constraints on policy makers can alter the intended effects of land use controls. The starting point of this line of literature recognizes that the market response to regulation as actually implemented may differ considerably from the ultimate policy goal.

Broadly put, there are three channels through which a government can restrict the exercise of private property rights: through direct regulation, by seizure or exercising eminent domain, or by taxing the property or the income derived from the property. Each is similar in that it ends up reducing the value of the affected property. Interestingly, the literature also reveals that these three ways of restricting property rights have different effects on investment incentives.[2] The focus of the recent research that is being discussed here, however, is on land use regulation.

[2] See Innes (1997) and the references therein for the eminent domain case and Turnbull (1988) and the references therein for the property value and income taxes cases.

II. Why Focus on Growth?

The increasingly important role of dynamic analysis in urban economics is motivated in part by the fact that urban growth and economic development are inherently dynamic processes. The urban area is a panorama exhibiting continuous change: population or employment are growing (or declining), interior sites are being abandoned or redeveloped for different uses, existing structures and infrastructure are constantly aging, and the fringe of the urban area is expanding. The static view of the urban economy can only account for such continuing change as the disequilibrium adjustment in response to constantly shifting demands and supplies. In contrast, the dynamic view envisions the constantly changing urban area as the equilibrium outcome, a time path of population or employment and land use patterns. Although static analysis does lead to insights that serve as an important starting point, deeper understanding of the process of urban growth or decline requires the dynamic or intertemporal perspective.

Observing Existing Land Use Patterns From the Dynamic Perspective

It is appropriate to consider how the dynamic analytical view focuses attention on what some policy advocates claim is evidence of market weaknesses or inefficiency. In particular, the fact that current investment decisions are made without perfect knowledge of the exact changes in future demands or prices means that past decisions made by private developers will often look "wrong" when enough time has gone by and what was uncertain at that time has become known history. Similarly, there is the temptation is to look at past actions and infer that the market just cannot get it "right."

There are, however, two points to remember. First, forward-looking investors take into account that urban development must meet the changing needs of present and potential future users over a period of time. As a result, the current development pattern can appear to be suboptimal by current standards. In addition, even past development can appear suboptimal by current standards. With respect to the apparent suboptimal current development pattern, though, forward-looking investors take into account anticipated future changes in users' demands. To take a simple

example, a young couple stretching their budget to the utmost to buy a large four bedroom house will appear to be making a poor choice based on their current incomes and housing needs. The fact that moving or physically adding on to an existing structure is fairly costly means that forward-looking consumers take into account their likely future growth in both income and housing demand when they start having children. From the longer perspective, then, the couple's current house purchase decision does not look like an obvious bad choice.

With respect to the apparent suboptimality of existing developed land from the current perspective, it must be remembered that investment decisions that were made in the past were made to serve consumers and businesses from that time to the present. The resultant development pattern should not be expected to serve consumers from the present to the some future time equally well. In a sense, the buildings that were put into use in the past have already served a part of their purpose. To expect them to serve current and future purposes equally well is to ignore the fact that these investments are by their very nature inflexible and costly to modify.

The second point to remember is that, because private decision makers must make investment decisions that will extend years into the future and because the future course of anything is not known with certainty, current decisions by market participants take into account that the future is uncertain. The broad pattern of returns to various activities may be evident, but the specific parameter values are not known with certainty. As an example, one way the market responds to this uncertainty is by holding back some parcels of land from immediate development, that is, creating leap-frog development patterns, essentially holding in reserve some land parcels to meet a potential future demand.[3] Whether that future demand matures sufficiently to make developing the land for that use feasible in the future is, of course, not known. But even if the anticipated future demand does not arise at that time, it does not mean

[3] Interestingly, the notion that leap-frog development patterns can have efficiency virtues is finally being recognized in the planning community. For example, the Metro Council is a governmental body responsible for regional development planning and policy in the 16 county metropolitan area surrounding Minneapolis-St. Paul. It has an established reputation for active land use planning and urban development policy, including policies designed to curtail leap-frog development and urban sprawl. It has adopted an "urban reserve" policy in the *Metro 2040 Plan* to hold undeveloped land in the interior of the metropolitan area for future urban development after 2020—leap-frog development induced by policy.

that holding back land from current development represents an inefficient allocation of resources in the economy.

Thus, far from being evidence of market inefficiency, observing past or current development that is out of sync with current market demands, or even leap-frog development, are what we would expect to see when market participants are cognizant of imperfect information and uncertainty; they are paying attention to and weighing the potential benefits and costs of uncertain future changes in population, consumers' preferences, production technology, and transportation networks when making investment decisions. The dynamic perspective requires that policy advocates be able to justify that the specific policies will yield a more efficient development pattern than the market will, not only today but also well into the future, based on the same (or even less) information about future trends.

One useful consequence of viewing economic growth as a continuing dynamic process is that it draws attention to political forces underlying the demand for land use regulation quite apart from the role of regulation in mitigating market inefficiencies. Successful urban development itself creates interest group pressure for curtailing further growth. As the metropolitan economy grows over time, the population grows (largely through in-migration to the metropolitan area), which creates perverse incentives for residents of jurisdictions to use the regulatory power of their governments to gain at the expense of others by "closing the door behind themselves" after they have settled an area. Thriving urban areas are growing urban areas. The relatively greater opportunities and higher standards of living pull in population from elsewhere. There is nonetheless an incentive by those who already reside in the thriving urban area to thwart this population growth to maintain the higher standard of living that is the source of attraction for immigration into the metropolitan area. Individuals find it appealing to use their first-mover advantage, relying on the machinery of their local governments to preserve the ambiance of their residential enclaves with surrounding green spaces or prevent aesthetically unappealing commercial development--in a way that shifts the cost of such regulation onto other parties. As explained below, some of the concerns of existing residents truly reflect market failures. Other arguments for growth control policies, however,

fall into the realm of what economists label "rent-seeking," using the public sector to garner benefits while the cost is borne by others.

The economic arguments traditionally used to justify land use controls and regulations are static in nature; they do not incorporate the intertemporal adjustments that market participants make in response to policy proposals. Recent research in this area exploits the dynamic perspective emphasizing what, where, and particularly *when* land development occurs. This research provides a conceptual foundation for understanding the rationale for and effects of land use regulation in a continually changing metropolitan economy.

Dominance of the Static Perspective

Why has the policy discussion been dominated by the static perspective for so long? First, static analysis--although often times complicated enough by itself--has given rise a manageable number of simple principles that provide good rules of thumb. This is useful for reducing a fairly complicated analysis to a manageable vehicle for explaining the rationale for and effects of policies to nonspecialists who ultimately have to either support or reject proposed regulations. Dynamic analysis, unfortunately, is typically much more complicated and technically demanding at this point than is static analysis. Until the dynamic perspective similarly can be reduced to a small set of relatively simple principles, it will not be useful to the broader policy and planning community.

Second, the continued reliance on the static approach to policy analysis is often justified by the belief that the principles for appropriate policy design in the static context generalize to the dynamic context. It is the job of academic researchers to verify when this is true and when it is not. This, by the way, is the motivation for some of the recent research on land use regulation. This line of research shows why some of the well-known static policy principles do not readily extend to a dynamic environment.

Finally, adopting a dynamic perspective forces the analyst to explicitly recognize the uncertainties and imperfect information about the course of events that will occur in the future. It may be that economists and other policy advocates fear that

explicitly acknowledging these uncertainties places a greater burden on them to provide better justification for their proposals. Relying on a static perspective relieves them of this burden.

Regulatory Policies as Signals

One factor that is typically under appreciated by policy makers is the dynamic signaling effect of current policy decisions. That is, a policy enacted today for a particular situation affects investors' expectations of future policies. Even though the current policy, say a prohibition of development for a particular parcel of land, may be in response to a very specific problem, the fact that the policy maker has obtained the power to enact such a prohibition makes it impossible for the policy maker to credibly commit to not imposing a similar prohibition on some other property in the future--even if the policy maker truly believes (at the time) that such a policy will never be enacted again. As a result, active involvement in the development process injects another source of uncertainty into the mix already facing private investors: regulatory risk. This regulatory risk is the point of departure for the land policy research discussed below.

III. Regulation and Property Rights

The problem confronting land owners and developers is that, regardless of its justification from the perspective of broader community welfare, land use regulation tends to reduce the market value of the affected property. Land use regulations essentially restrict the exercise of private property rights. The benefits of such regulation accrue to residents of the jurisdiction. The costs of regulation, on the other hand, fall on the property owner in the form of diminished value. Of course, this "loss" can be justified in some cases as a removal of a property value premium that arose only because the property owner was free to impose costs on others. Nonetheless, the consequence of the regulation is typically evident in the form of lost property value.

Regulatory Takings

It is possible for a particular land use regulation to substantially reduce the value of the affected property, even though the owner retains title to the asset. In a sense, this loss of value is equivalent to a discriminatory tax or exaction. Discriminatory taxes, however, violate the principle of horizontal equity in taxation. Even narrowly applied land use regulations for specific goals can lead to capricious reallocations of wealth among individuals and therefore need to be implemented with due care. For example, a family with all of their wealth in the form of vacant land will be "taxed" by new land use regulations that reduce the value of the land (even though, as we shall see below, the regulations are applied to someone else's land) while another family with an equal amount of wealth invested in financial assets unrelated to the regulated land market will suffer no such loss. Two families of equal economic circumstances at the outset, yet one is implicitly taxed by land use regulation and the other is not. In a sense, wealth has been reallocated from the landowning family to the residents of the jurisdiction who benefit directly from the new land use regulation, where the residents who benefit directly from the regulation may include the other wealthy family fully invested in financial rather than real estate assets. This raises the question, why

should specific individual landowners be singled out to bear the burden of public policy that other equally wealthy individuals do not?

Another aspect of land use regulation arises in the recent literature, the results of which are summarized below. Because land use regulation alters investment incentives for both regulated and for *unregulated* property, the unintended consequence of a regulation that is intended to improve social well-being may be to reduce it.

The importance of the tie between regulation and property values has been recognized for a long time but has taken on a larger role in recent policy debates over the tension between regulation and property rights. The Fifth Amendment of the U.S. Constitution prohibits the taking of property by a government without just compensation to the owners, but it does not cast a clear and absolute prohibition on regulation that reduces property values. The Supreme Court recognizes that governments must sometimes restrict the property rights of one group of individuals in order to protect the property rights of others or for enhancing the general welfare. In the landmark case *Pennsylvania Coal v. Mahon*, however, Justice Holmes also argued that there is a point after which the property owner must be compensated for the loss of value arising from the regulation. One problem with this decision is that it does not establish a numerical standard for the loss that property owners must bear before the burden constitutes a taking and requires compensation. The lack of a clear-cut numerical standard for what is an acceptable diminution of value creates uncertainty; in one case, a 75% reduction in property value from zoning regulations represents an unconstitutional taking (*Dooley v. Town Plan and Zoning Commission of Town of Fairfield*) while in another case a 90% diminution does not (*Turnpike Realty v. Town of Dedham*).

Recent important Supreme Court cases have helped to clarify the nature of the constitutional constraint on the design and implementation of land use regulations. In *Nolan v. California Coastal Commission* and *Dolan v. City of Tigard*, the local governments required that the property owners "contribute" some of their land to an alternative specified use in order to obtain permission to

develop their remaining land. The cost borne by the owners passed the takings threshold and the Court found in their favor. In *Lucas v. South Carolina Coastal Council* the U.S. Supreme Court sent the case back to the lower court, with the burden on the Coastal Council to show why its development prohibition for private beachfront property was not an unconstitutional regulatory taking.

It is still uncertain where the dividing line lies between a constitutional exercise of police power and an unconstitutional taking. Many land use regulations are rationalized as attempts to govern nuisances and correct externalities that give rise to inefficient market outcomes, which justifies them as constitutional exercises of police power rather than takings.[4] As a result, the threat of uncompensated or under compensated lost property value remains a relevant concern for U.S. investors in developable urban land. Investors recognize these risks, so the threat of land use regulation affects the pace and pattern of land development. The question is: how are investment incentives altered?

Before turning to that question, it is interesting to note at this point that the constraint on regulatory behavior that is imposed by a strict "no takings" rule does not eliminate uncertainty about the land use regulations that owners can expect to confront (Innes, 1997; Turnbull, 2001). Suppose that we follow a clear-cut version of the current standard in the U.S.: in order to avoid being labeled an unconstitutional taking, a particular land use regulation must be justifiable as a legitimate police power exercise. As explained above, to be considered an exercise of police power requires that the regulation be imposed to counter a specific market failure that harms the welfare of individuals in the community. The existence of likely market failures will only become evident with the passage of time. This implies that, at any given point in time, the owner of a currently

[4] The recent U.S. Supreme Court decision *Tahoe-Sierra Preservation Council v. Tahoe Regional Planning Agency* defines a wide range of regulatory actions that can be justified as police power when recognized externalities or other threats to the public good are evident. This decision maintains that local governments and regulatory bodies can impose development moratoria in order to study and design appropriate land use regulations when they can establish a case justifying some type of regulation. The ensuing loss of property use or diminution of value does not entail an unconstitutional regulatory taking. The decision does not establish a bright-line rule for a "reasonable" length of time for the development moratoria in such situations.

unregulated parcel of land cannot be sure if or when there will arise a legally defensible justification for regulating his land. Thus, the requirement that all such regulations be justified as police power does not resolve the investors' uncertainty over the future status of currently unregulated property.

Threat of Regulation

The impact of land use regulations goes beyond the effect on asset value. The *threat* of regulation, whether or not the taking actually occurs, introduces uncertainty into property rights, and as a consequence, alters investment incentives. As a broad principle, uncertainty in property rights--regardless of its source--affects economic development in general and the process of urbanization in particular.[5] Poorly defined or uncertain property rights affect the overall level of investment through several channels. Alchian and Demsetz (1973) and Demsetz (1967) argue that the threat of expropriation tends to reduce investment, thereby slowing the pace of economic growth. This is because investors are reluctant to put their capital into projects whose returns might be appropriated in the indefinite future; as a result investors will have shorter time horizons, favoring projects with rapid payouts over longer term commitments. Feder, et al. (1988) emphasize that poorly defined or uncertain property rights make it difficult to use real estate as collateral, increasing the difficulty of obtaining debt financing to pursue the long-term capital commitments needed for structures, infrastructure, and other improvements to property. This reduction in liquidity hampers capital accumulation in the economy, thereby slowing economic growth.

The property rights uncertainty that is introduced through land use regulation by local and regional governments, however, has its primary effects on investment through a different channel. Since land use regulations typically restrict the quantity or the type of capital improvements that can be applied to specific parcels of land, they are clearly not the same as out-right expropriation of

[5] See Alchian and Demsetz (1973), Besley (1995), Demsetz (1967), Feder, et al. (1988), North and Thomas (1973), Rosenberg and Birdzell (1986), Torstensson (1994), Miceli, Sirmans, and Turnbull (2000; 2002), and Bohn and Deacon (2000).

land and capital. Land use regulations also need not affect the liquidity of the real estate in question, although they can reduce the market value of the regulated (and, as argued here, even the unregulated) real estate. The economic consequences of land use regulation has two levels. At one level, the regulation places direct restrictions on investment decisions, limiting the range of options open to property owners and thereby narrowing property rights. At a deeper level, though, even when not imposed, the threat of regulation itself alters private property rights by restricting landowners' potential options. That is, the mere threat of regulation affects investment incentives. This is the focus of recent research on land use regulation: precisely how does this perceived threat affect development incentives?

The studies by Riddiough (1997) and Turnbull (2001, 2002a) examine how the modified private property rights under threatened regulation affect the timing and density of development in an urban land market. The consequences of distorting urban land development incentives should not be taken lightly. Given the large commitment of resources that such development requires and the irreversibility of such investment, inefficient resource allocation decisions at the initial development stage can have long lasting effects. The imprint of past decisions are observed on the face of today's urban areas; investment distortions, from whatever source, can be significant because their consequences extend long into the future.

Turning briefly to the underlying methodology issue, the dynamic approach to modeling land development is essential to this line of literature for several reasons. First, it turns out that static model predictions generally do not extend to the dynamic case when development is irreversible, whether regulation is certain or uncertain. This has been illustrated by Titman (1985), Geltner, et al. (1996), and Turnbull (1991, 2002b), who present dynamic analyses of land markets in which land use regulations are imposed in a way that all investors know with certainty their form and function.

Although the discussion below does touch on that particular line of published research, the bulk of what follows emphasizes the uncertain nature of land use regulation--at least from the investors' perspective. This view emphasizes that the *threat* of regulation (as well as the regulation that is finally implemented) is an important factor. The threat creates incentives for investors to attempt to reduce the risk of exposing their land and capital investments to regulation, leading to temporal distortions in the pattern of investment. The research discussed in the following sections also shows that these distortions generally differ from the effects of regulation under certainty.

IV. Prohibiting Development

This section considers the case where a regulatory taking is in the form of development prohibition and draws from Turnbull (2002a). The regulatory restrictions in the cases *Nolan v. California Coastal Commission*, *Dolan v. City of Tigard*, and *Lucas v. South Carolina Coastal Council*, mentioned above, are examples of the type of development prohibition examined here. In a different vein, Environmental Protection Agency (EPA) policies regarding the development of wetlands and watershed land fall within this case as well. While the EPA prohibits developing wetlands, permission or waivers can be obtained. Whether or not an owner can obtain a waiver, however, is not something that is known with certainty until after the application is made. And the application is not going to be made until the demand for a particular type of developed land has sufficiently matured in the market to make such development feasible. Thus, prior to initiating the development process, it remains uncertain whether or not the development will be prohibited; the regulation in effect remains only a threat of prohibition until actually implemented.

Similarly, the Endangered Species Act (ESA) provides another example of this type of regulation. An owner of undeveloped land may have evidence that the property is the habitat of a protected species. The absence of such evidence, however, does not establish that the property is *not* a habitat of some protected species. In this case maybe a more stringent search would reveal such evidence. Perhaps the fortuitous discovery of a novel butterfly by a naturalist trespasser on the property will provide the evidence needed to invoke the ESA development restrictions. Or, it may be that a species known to be living on the land in question that is currently not protected may be designated as a protected species at some future date. In any event, the ESA creates a degree of uncertainty over possible development restrictions that might arise in the indefinite future.

The essence of the analysis is as follows. First, note that the developer retains unfettered ownership until (and if) the government imposes the regulatory restriction at a particular point in time. Whether or not such a restriction will be imposed on the property by the regulatory body is only probable, though, and the point in time at which it might be imposed (if ever) is not known with certainty by the developer.

Viewing land use regulation as stochastic or uncertain recognizes the constraints imposed upon state and local governments in the U.S. In order for their regulatory policies be interpreted as police action rather than takings, they cannot impose restrictions on a particular parcel of land until there is evidence (or can assert with some degree of confidence in the face of an otherwise likely legal challenge) that such regulation can be justified as contributing to the common welfare.

In all cases considered here, the government does not take outright possession of the land. The government does, however, reduce land value by restricting the range of allowed development. Of course, this type of restriction is only meaningful for undeveloped land. Once a particular tract of land is developed, the irreversibility of land improvements erases any remaining threat of this kind of regulation for the tract.[6]

When expressed in this way, we can see the structure of the problem confronting the investor and how a development prohibition policy affects development incentives. Consider a particular tract of undeveloped land. Given that development is not currently prohibited, an investor can either build on the land now or can choose to wait. If the decision is to wait, however, the investor is then also opening himself to the risk that the development prohibition will be imposed at some point in the future before the land is developed. When making the decision to develop the land today (for the current best use) or wait until later (for the future best use), potential investors weigh the returns to the current and future best uses. But, investors also weigh the threat of the development prohibition being imposed before the land is developed if they choose to wait for the future best use. The regulatory threat increases the uncertainty of investment returns from waiting to build on the land. From today's perspective, this risk is an additional cost of waiting that reduces the expected present value of the future best use. The additional risk introduced by the threatened regulation will tip the comparison of the development options in favor of the current period project for some tracts of land. As a result, the investment plans call for earlier development of these tracts than would otherwise be the case. The

[6] See Innes (1997) and the references therein for situations in which the government does take possession of the land through eminent domain. Unlike the regulatory threat examined here, the threat of eminent domain remains extant even after the property has been developed.

threat of the regulation, rather than the regulation itself, creates an incentive to hasten the pace of development.

The effects on the structural density of the development follow from the effect on timing. When the competing demands for alternative uses are changing over time such that the current "best use" has a lower structural density than a future "best use," then the "demanded density"[1] is said to be rising over time (Wheaton, 1982; Turnbull, 1988). When the underlying demand conditions yield a current best use that has a higher structural density than a future best use, then the demanded density is said to be falling over time. The effect of the regulatory threat on structural density depends upon whether the demanded density is rising or falling over time.

To summarize for unregulated property: *The threat of a development prohibition shortens the waiting time for land development, increasing the pace of development for unregulated property. The threat of development prohibition decreases the density of development at locations where the demanded density is rising over time, that is, at those locations in the urban area where the current best use entails a lower structural density than does the future best use. On the other hand, the threat of development prohibition increases the density of development at locations where the demanded density is falling over time, that is, at locations where the current best use entails a higher structural density than does the future best use.*

For property that actually becomes subject to the regulation before it is developed, of course, development is prohibited and therefore does not take place, regardless of the owner's initial plans.

Note that the discussion to this point also illustrates how the threatened policy elicits an opposite effect than intended. For example, when greenspace or watershed restrictions are imposed in one region in a spatial land market, any belief by landowners that the policy could be expanded to a wider region will increase the pace and density of surrounding development if policy-makers cannot credibly commit to restricting the development policy to the narrower targeted region. As stated earlier, the problem from the policy-makers' perspective is how to credibly commit to potential investors to never impose a similar regulation outside the original targeted region. This difficulty is especially acute for local and regional land use planning

authorities, given that the political pressure by local residents to do so will likely increase in the future as the urban growth trend continues.

V. Regulating Development Timing

Instead of an outright prohibition on developing a specific parcel of land, consider how the threat of a development holiday or moratorium alters development incentives. This discussion follows the analysis in Turnbull (2001). The general principles for this case are best seen by modifying the setting envisioned in the previous section. To begin, note that a greenspace externality is an external benefit from undeveloped land that disappears once the land is developed. As in the previous section, investors again do not know with certainty at the outset whether or not a particular parcel of vacant land is a source of a greenspace externality; evidence of the externality, or even if it is ever going to be present, only becomes evident over time.

Once it has become clear that a particular parcel of land is the source of a greenspace externality, however, the land use regulator is free to impose on the property a moratorium of an appropriate length of time. If the moratorium is permanent, then this case reverts to the previous situation in which further development is prohibited outright. If the moratorium is not permanent, though, the developer will be allowed to proceed after the designated interval of time has passed. In light of the earlier discussion of regulatory takings and police power, evidence of a greenspace externality ensures that the regulation is defensible as an exercise of police power and is not an unconstitutional taking. This implies that adhering to the constraint that regulation not be construed as a taking means that the government can impose the efficient corrective development policy only after the externality is known to exist for the specific plot of land. Since the existence of an externality for the land parcel is uncertain at any point in time until there is clear evidence, the relevance of ensuing regulation for the tract is uncertain as well.

The threat of regulation is an important factor. The possibility that at some time in the future the property might be revealed to be the source of a greenspace externality creates an incentive for the potential investor to attempt to deal with the regulatory risk by changing the development strategy.

Consider the private investor's behavior under the policy in which the planning authority imposes a development holiday on the land only when (and if) it is

revealed to be the source of a greenspace externality. This policy, although efficient after the fact for regulated land, creates a risk of regulation for a broad swath of landowners in the locale, whether or not ultimately falling under the development moratorium.

From a potential investor's perspective, at any point in time only one of two regulatory events can occur given that the moratorium has not yet been imposed. Either the development moratorium is imposed at that time or it is not. When the moratorium is imposed, the investor's best strategy is straightforward: develop the land as soon as it is allowed. And, when finally developing the land when allowed in the future, develop it in the configuration or use that the market demands at the allowed development time. That is, develop the land according to the best use that is relevant to the projected market conditions that will exist when the development is finally allowed.

This simple rule makes sense. After all, when the development moratorium is imposed, it is intended to postpone the developer's decision. The second effect also makes sense; the most profitable development pattern in earlier years when the unrestricted developer would have pursued the project will likely not be the most profitable project in later years when the market for alternative land use configurations has matured.

When actually imposed, the moratorium affects the ultimate use to which the regulated land is put. When the future best use entails a higher structural density than the current best use (that is, when demanded density is increasing over time), forcing the regulated property to postpone development leads to it being developed for a use with greater structural density than it otherwise would have without the moratorium. On the other hand, when the future best use entails a lower structural density than the current best use (that is, when demanded density is decreasing over time), the development moratorium leads to a lower structural density than otherwise would have been the case for the regulated tract of land.

While the preceding deals with what happens when the moratorium is actually imposed, there is also the second possible regulatory outcome at any point in time, that the moratorium is *not* imposed. In this case the developer's best strategy is

to wait until what would be the planned development time without regulatory restriction. This planned development time, however, is still affected by the future threat of the moratorium being imposed. The longer the land remains undeveloped, the longer it remains exposed to the potential regulation. Once developed, the threat of the governmentally imposed postponement disappears. Thus, investors face an additional holding cost when waiting for the land market to mature for their most desired project; the threat of a future moratorium creates this additional holding cost, which in turn provides an incentive to develop the land sooner than without the threat. Put somewhat differently, the threat of being forced to postpone development eliminates some feasible alternative projects from consideration, thereby reducing the "option value" of vacant land as a source of potential development projects. The reduction in the vacant land value makes earlier development desirable.

This acceleration of the planned development time also affects the way in which unregulated land is ultimately developed. When the future best use entails a higher structural density than the current best use, the shorter planned waiting time to development prompts investors to prepare the property for a use with lower structural density than they would have without the threatened moratorium. On the other hand, when the future best use entails a lower structural density than the current best use, the threatened development moratorium leads to a higher structural density than otherwise would have been the case for that particular tract of land.

Of course, some of the land awaiting development will inevitably get "caught" in a moratorium. Nonetheless, the moratorium does not force all developers in the market to pursue their projects at the earliest feasible date; rather they must balance the risk of the moratorium against the gains from postponing the development time as the market for the planned project matures to its most profitable state.

To summarize: *The threat of a development moratorium gives investors an incentive to prefer projects with shorter waiting times than they would otherwise prefer without the threat. Investors' incentives favor projects with a lower structural density than without the threat at locations in the urban area at which the current best use structural density is lower than the structural density of the future best use*

(i.e., the demanded density is rising over time). The threat of a moratorium prompts investors to favor projects with a higher structural density than without the threat at locations where the current best use structural density is higher than the future best use structural density (i.e., the demanded density is falling over time).

Of course, different parcels of land in the urban area will differ by their likelihood of being identified with the externality, hence being an intended target of the regulation. Turnbull (2001) also shows that high risk land will have a more rapid planned development pace than otherwise identical low risk land, where the relative risk reflects the market's estimate of the likelihood that the specific parcel of land will be subject to the regulation at some time in the foreseeable future. The planned capital density for high risk land will be greater than that for low risk land at those locations where the demanded density is falling over time. Similarly, the planned capital density for high risk land will be less than that for low risk land at those locations where the demanded density is rising over time.

Thus, we see once again how subtly regulation can work against its intent. In this illustration, a threatened development moratorium can elicit the opposite effect than intended for land not generating an externality. Comparing the investor's planned development strategy with what would have been the economically efficient development pattern for such land, we find that development ends up proceeding more rapidly and at a lower density than is efficient when the demanded density is rising over time. It ends up proceeding more rapidly and at a greater density than is efficient when the demanded density is falling over time. In this way, the uncertainty about the underlying externality and the attendant development moratorium leads to inefficient development of the land that is not found to harbor the externality.

So, how does lengthening the development moratorium (when it is imposed) affect investor's incentives? Turnbull (2001) shows that a longer development moratorium speeds the planned development pace. The effect on structural density depends upon the underlying growth patterns in the demands of alternative land users. Lengthening the moratorium decreases the planned structural density for land at locations where the demanded density is rising over time; lengthening the moratorium increases the structural density at locations where the demanded density

is falling over time. These relationships are intuitively appealing given the patterns described above.

The results have important implications for the unintended distorting effects of the regulatory threat in the broader land market as well. Generally, the greater the possible externality associated with the undeveloped land, the longer the duration of the efficient development holiday. Therefore, the preceding paragraph implies that land that might generate a larger greenspace externality will have a more rapid planned development pace than land that might generate a smaller greenspace externality. The divergence between investors' strategies and efficient outcomes for unregulated land is larger the greater the possible size of the greenspace externality elsewhere in the market. Simply put, a greater potential externality drives a larger wedge between private investors' development timing and the economically efficient timing.

VI. Restricting Allowed Uses

The series of papers by Titman (1985) and Turnbull (1991, 2002a) study how restrictions on allowed uses affect investment incentives and urban development in a growing economy. This section discusses the effects of zoning or other land use regulations in the form of maximum density restrictions. The material presented here is based largely on the relevant parts of Turnbull (2002a). Discussing of this type of regulation is by necessity more complicated than explaining the development prohibitions or moratoria in previous sections.[7] A wide range of zoning restrictions (by allowed use, type, etc.) can be included in this density restriction characterization, given that different uses generally entail different land-structure configurations, hence different structural densities.

Dynamic Effects of Land Use Restrictions Under Certainty

Turnbull (1991) shows that restricting allowed uses with certainty speeds development where the demanded density is decreasing over time and slows development where the demanded density is increasing over time. This timing relationship makes sense in the dynamic or intertemporal view used repeatedly above. If the allowed density is less than that which the investor's most profitable development scheme would call for, then the land use restriction is binding on the development. Investors have an incentive to adopt the allowed use, which is the best use for an earlier development time than that most preferred when the demanded density is rising over time. When the demanded density is falling over time, on the other hand, the allowed use is the best use for a later development time than that most preferred without the regulation. Once again the determining factor for how the regulation affects development patterns rests with the underlying pattern of growth in the demands for alternative land uses over time.

The previous section shows that development proceeds everywhere at a more rapid pace in response to a threatened development moratorium. Here, on the other hand, density restrictions can either speed or slow development. What explains the

[7] The effects of policies that can be interpreted as minimum density restrictions are not included here in order to keep the discussion as straightforward as possible. Although not discussed here, the incentives effects of minimum density restrictions are also studied by Turnbull (2002a).

differences in regulatory effects? It turns out that there are different forces at work. In part, these conclusions hinge upon the assumption that investors know the zoning regime with certainty; all land in the market is already zoned according to allowable final use and there will be no changes or variances in the future. Although providing a good starting point for the ensuing line of research, this characterization of zoning is, of course, not even a remotely accurate depiction of how land use regulation is devised and put into play over time. A more accurate picture recognizes that zoning and other types of allowed density restrictions can be the source of a particular type of uncertainty facing investors (Ellson and McDermott, 1987). Zoning plans change over time in response to local political pressures by residents and developers as well as the observed evolving patterns of land use in the urban area. Even when the zoning pattern is set, variances are possible. Future rezoning and variances are, of course, by their nature uncertain until they happen. This observation motivates the recent research of how uncertainty over future structural density regulation affects the urban land development process, the topic to which we now turn.

Uncertain Restrictions on Allowed Density

Turnbull (2002a) combines the probabilistic structure of the regulation envisioned in the previous section with the type of density restrictions envisioned in the earlier model of zoning or land use controls in order to evaluate the net effect of the policy on investment patterns. That study examines a variety of development restrictions. This discussion, however, focuses on development restrictions that effectively place an upper bound on the allowed structural density. That is, the focus is on regulations like large lot zoning in residential areas that rule out high density development--unless, of course, a variance is obtained, which is uncertain until applied for.

To keep the description as straightforward as possible, the regulatory environment is envisioned as one beginning with no density restriction. Over time, a binding density restriction might or might not be imposed. Of course, imposing a non-binding density restriction is equivalent to having no restriction imposed. For example, if the most profitable use for the land would be single family detached

houses and the zoning restriction prohibits nonresidential uses for which multi-story office buildings or large commercial structures would be appropriate, then the restriction is not binding on developers' decisions. In the context of the model used here, this case is viewed as one in which there is no restriction imposed on the property in question. The regulatory process can instead be viewed as one in which the maximum allowed density is imposed at the outset, but whether or not a variance will be allowed will not be known until applied for at a later date. However envisioned, for the sake of this discussion, the same analytical framework applies.

Not surprising given the results discussed in previous sections, the threat of restrictions on allowed use creates a regulatory risk that can be interpreted as an additional holding cost for undeveloped land. The regulatory risk therefore prompts investors to pursue earlier development than they otherwise would. Once again, the regulatory threat hastens the overall pace of development for unregulated land. In this case, though, determining effects on the structural density of unregulated land and the effects on the timing of the development of regulated land requires a slightly different approach.

Market participants take into account the possibility that the binding land use restriction might be imposed at some time prior to the planned development time. Consider a time period before the planned development time for the tract of land, when the development restriction has not (yet) been imposed. There are only two possibilities: either the restriction will not be imposed at that time, possibly to be imposed at some unspecified future date, or it will. Consider each possibility in turn.

First, there is the possibility that the regulation is not imposed at the point in time envisioned. In this case, the investment strategy is simple: if this is the previously planned development time, then the market for the most profitable use is ripe and the investor goes forward with the planned project. If the market for the most profitable use will not ripen until some time in the future, though, development will await that time. In either case, the investor undertakes the project at the planned density.

Now consider the second possibility, that a binding land use restriction is imposed at the point in time envisioned. Since the maximum density restriction is

binding, it is lower than the planned density. The investor's optimal strategy is to revise the planned project to coincide with what is now allowed, and then await the maturing of the allowed project in the market. There are two sub-cases to examine. For one, it is possible that the market is already fully matured for the allowed project. Since the more profitable project for which the investor was waiting to mature when the land use restriction was imposed is no longer an option, the investor now has an incentive to immediately develop the land for the allowed use. It turns out that is will only occur when the demanded density is rising over time for the land parcel in question.

For the other sub-case, though, if the land use restriction is imposed before the allowed use has fully matured in the market, then investors have an incentive to wait until the market matures for the allowed use. It turns out that this will occur when the demanded density is falling over time for the land parcel in question.

Sorting out the effect of the threatened maximum allowed density restriction on development outcomes depends upon whether the plot of land would be developed earlier or later when regulated compared to the most profitable time to develop it when unregulated (but still threatened with regulation). If the best time to build for the allowed land use is later than the best time to build for the most profitable land use, then there is never an incentive to develop the land prior to the original planned development time. On the other hand, it is possible that the best time to build for the allowed land use is actually before the best time to build for the most profitable land use. In this situation, actually imposing the land use regulation hastens the development time, and the land will be developed before the originally planned development time. What is interesting in this case is that actually imposing the land use restriction speeds the pace of development of regulated property relative to property that remains unregulated. It turns out that whether or not imposing the land use restriction slows or speeds development of regulated land relative to unregulated land is determined in part by how the demanded density is rising or falling over time.

How does the threat of a density restriction affect the incentives to develop unregulated property? It turns out that there are the two possibilities to consider:

- *When regulated property is developed before unregulated property, the threat of a maximum allowed density restriction hastens the planned development time and leads to a lower structural density.*

- *When the regulated land is developed after unregulated land, the threat of a maximum allowed density restriction hastens planned development timing. The effect on the structural density depends upon whether the demanded density in the market is rising or falling over time at that location. The structural density is higher than the efficient level when the demanded density is falling over time; the structural density is lower than the efficient level when the demanded density is rising over time.*

In summary, *the threat of binding land use regulation tends to speed the pace of development for unregulated property. The effects on structural density depend upon how the underlying demands for land expressed by different land uses are changing over time. The actual imposition of the allowed use regulation has a little more complicated effect on timing decisions for regulated property, but the outcomes once again systematically depend upon how the demanded density is changing over time.*

Regulatory Risk Versus Private Ownership Risk

The above results for development prohibition, moratoria, or density restrictions reveal a basic principle: all create an additional risk cost of holding land, thereby creating greater incentive for investors to develop property more quickly. This prompts a relevant question in light of the broader literature on property rights and urban development. For example, Miceli, Sirmans, and Turnbull (2000; 2002) examine how ownership risk arising from private sources, like boundary encroachment, squatting, title system errors, or the other complications, affect development. Is the effect of public sector regulation risk comparable to that from these private sources of property rights risk? Miceli, et al. find similar results for private sources of ownership risk to the extent that investors have an incentive to accelerate the development of vacant land whenever possible. The effects on structural density also depend upon how the underlying demands for land are changing over time--results that are similar to the implications for unregulated property in the cases discussed above.

A big difference between the effects of private source ownership risk and regulatory risk is on the part of the market that is actually subject to regulation. With private source risk, of course, there is no distinction between affected and unaffected property, whereas with regulatory risk, we see a profound difference between how unregulated and regulated property is affected. As an example, the discussion above explains why the regulatory threat generally hastens the development of regulated land where the demanded density is rising over time while slowing the development of regulated land where the demanded density is falling over time. As a consequence--and in contrast with the effects of private source ownership risk--this particular regulatory regime threat can lead to faster or slower development of regulated land *on average* across the land market, depending upon patterns of growth in the underlying land demands at each of the affected locations. Perhaps not surprisingly, local market conditions matter.

VII. Development Fees

Development fees represent an additional cost of development to investors and will in general slow the development pace throughout the jurisdiction--provided that the fees are both imposed with certainty and are invariant with respect to planned development density. There are, however, two dynamic aspects of development fees that are briefly considered here.

First, if the fee varies with planned structural density, then it will also affect investors' plans for how to develop the property. The fee becomes, in effect, a tax on buildings, with the tendency of such taxes to reduce development density and increase the total area of land that is developed to accommodate a given population (Brueckner, 1986). In a growing economy, though, such a development fee will also affect the pace of development (Turnbull, 1988). When the current best use entails a lower density than the future best use--the increasing demanded density case--then the development fee that favors lower density development patterns will also tend to shorten the planned waiting time, hastening the pace of development in those parts of the urban area. When the current best use entails a higher density than the future best use, however, the effect is just the opposite: the development fee that favors lower density prompts investors to adopt a longer waiting time, slowing the pace of development in those parts of the urban area.

Second, if the fee is imposed with certainty (but does not vary with planned density) then it will still affect the density of development in the affected region. It is interesting to also note that in this case the development fee does not match slowing development with the solution to a specific identified economic "problem" like congestion or inadequate public infrastructure capacity. Nonetheless, such a fee increases the cost of development when undertaken, slowing the pace of development in the affected region. But, there is no reason to expect to see a general slowing of development to enhance well-being of residents in the locale. The effects on the structural density will vary with the pattern of growth in the underlying competing demands for developed land in the locale; structural density rises for those locations at which the demanded density is rising over time and declines for those locations at which the demanded density is falling over time.

VIII. Conclusion

The purpose of this paper was to explain the main results of recent research on how land use regulations affect the pace and pattern of urban development. It provided a nontechnical survey of the results in order to help uncover general principles or patterns observed across different types of regulation. Pulling the results together, several patterns emerge.

The challenges to property rights arising from the threat of land regulation affects investment incentives differently than property rights uncertainty engendered by unclear legal standards, capricious enforcement, or public sector corruption. While poorly defined or defended property rights in general lead to a slower pace of development in an economy, the threat of land use regulation generally creates incentives for more rapid development than would otherwise be observed in the market. The discussion here provided an informal explanation for the observed difference and how the specific nature of the threat to property rights matters when considering the way it alters investment incentives.

The effect of regulatory threats on the planned structural density varies across the urban area and systematically depends upon the growth pattern in the underlying land demands by competing land uses. In general, though, the threat of regulation decreases the planned structural density at locations where the demanded density is rising over time, that is, at sites where the current best use has a lower structural density than the future best use. Similarly, the threat of regulation increases the planned structural density at locations where the demanded density is falling over time, or where the current best use has a higher structural density than the future best use.

The research summarized in this paper provides positive analysis of the regulation-development nexus. The results give a starting point for formal dynamic welfare analysis, weighing the direct effects of policy on regulated land against the intertemporal distortions for unregulated land. Since unregulated land subject to regulatory risk is generally developed more quickly than is socially efficient, this effect must be taken into account and weighed against the efficiency gain accomplished by resolving the externality incentives effects for regulated land. The

conclusions for policy makers from such a research program are not obvious at this point, but ongoing research already shows that the normative efficiency rules arising from the popular static perspective do not generalize to the dynamic environment (Turnbull, 2002b). More work must be done in this direction, however, before easy-to-use general principles emerge for readily weighing the dynamic efficiencies of different regulatory regimes.

Bibliography

Alchian, A., and H. Demsetz (1973) "The Property Rights Paradigm," *Journal of Economic History*, 33: 16-27.

Besley, T. (1995) "Property Rights and Investment Incentives: Theory and Evidence from Ghana," *Journal of Political Economy*, 103: 903-937.

Bohn, H., and R. J. Deacon (2000) "Ownership Risk, Investment, and the Use of Natural Resources," *American Economic Review*, 90: 526-549.

Brueckner, J. K. (1986) "A Modern Analysis of the Effects of Site Value Taxation," *National Tax Journal,* 39: 49-58.

Brueckner, J. K. (2000) "Urban Growth Models with Durable Housing: An Overview," in *Economics of Cities*, edited by J.-M. Huriot and J.-F. Thisse, Cambridge, UK: Cambridge University Press.

Demsetz, H. (1967) "Toward a Theory of Property Rights," *American Economic Review, Papers and Proceedings*, 57: 347-359.

Dolan v. City of Tigard, 194 U.S. 4826 (1994).

Dooley v. Town Planning and Zoning Commission for Town of Fairfield, 151 Conn. 304, 197 A.2d 770 (1964).

Ellson, R., and J. McDermott (1987) "Zoning Uncertainty and the Urban Land Development Firm," *Journal of Urban Economics*, 22: 209-222.

Feder, G., T. Onchan, Y. Charbain-Wong, and C. Hongladarom, *Land Policies and Farm Productivity in Thailand*, Baltimore: Johns Hopkins University Press (1988).

Fujita, M. (1982) "Spatial Patterns of Residential Development," *Journal of Urban Economics,* 12: 22-52.

Geltner, D., T. Riddiough, and S. Stojanovic (1996) "Insights on the Effect of Land Use Choice: The Perpetual Option on the Best of Two Underlying Assets," *Journal of Urban Economics*, 39: 21-50.

Innes, R. (1997) "Takings, Compensation, and Equal Treatment for Owners of Developed and Undeveloped Property," *Journal of Law and Economics*, 12: 403-432.

Lucas v. South Carolina Coastal Council, 505 U.S. 1003 (1992), rem'g, 404 S.E. 2d 895 (S.C. 1991).

Miceli, T. J., C. F. Sirmans, and G. K. Turnbull (2000) "The Dynamic Effects of Land Title Systems," *Journal of Urban Economics*, 47: 370-389.

Miceli, T. J., C. F. Sirmans, and G. K. Turnbull (2002) "Land Ownership Risk and Urban Development," Center for Real Estate and Urban Economic Studies, University of Connecticut.

Nolan v. California Coastal Commission, 483 U.S. 825 (1987).

North, D., and R. Thomas (1973) *The Rise of the Western World: A New Economic History*, Cambridge, UK: Cambridge University Press.

Pennsylvania Coal v. Mahon, 260 U.S. 393 (1922).

Riddiough, T. J. (1997) "The Economic Consequences of Regulatory Taking Risk on Land Value and Development Activity," *Journal of Urban Economics*, 41: 56-77.

Rosenberg, N., and L. E. Birdzell (1986) *How the West Grew Rich: The Economic Transformation of the Industrial World*, New York, NY: Basic Books.

Tahoe-Sierra Preservation Council v. Tahoe Regional Planning Agency, 533 U.S. 948 (2001).

Titman, S. (1985) "Urban Land Prices under Uncertainty," *American Economic Review*, 75: 505-51.

Torstensson, J. (1994) "Property Rights and Economic Growth," *Kyklos*, 47: 231-247.

Turnbull, G. K. (1988) "The Effects of Local Taxes and Public Services on Residential Development Patterns," *Journal of Regional Science*, 28: 541-562.

Turnbull, G. K. (1991) "A Comparative Dynamic Analysis of Zoning in a Growing City," *Journal of Urban Economics*, 29: 235-248.

Turnbull, G. K. (2001), "Development Moratoria," Department of Economics, Georgia State University.

Turnbull, G. K. (2002a), "Land Development under the Threat of Taking," *Southern Economic Journal*, in press.

Turnbull, G. K. (2002b), "Urban Growth Controls: Transitional Dynamics of Development Fees and Growth Boundaries," Department of Economics, Georgia State University.

Turnpike Realty Co. v. Town of Dedham, 284 N.E.2d (Mass. 1972).

Wheaton, W. C. (1982) "Urban Residential Growth under Perfect Foresight," *Journal of Urban Economics,* 12: 1-21.

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